

Appl. No.: 10/636,172

Preliminary Amdt. Dated September 7, 2004

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions and listings of claims in this application.

1. (Currently Amended) ~~The~~ A method for stabilizing operation point and optical output of an external optical modulator including a light source, an external optical modulator modulating the light from the light source, an optical detector detecting the output-light from the said external optical modulator, and the means of for regulating direct current bias applied to the said external optical modulator, which regulates the direct current bias determining the operation point of a modulation curve of the said external optical modulator, according to the output of the said optical detector, ~~wherein;~~ comprising the steps of:

superimposing onto said direct current bias a low-frequency signal, which is frequency below the
a lower limit of the a signal frequency band of an input signal inputted to the said external optical
modulator; ~~is superimposed onto the said direct current bias,~~

extracting and the a low-frequency component included in the output of the said optical detector;
~~is extracted,~~

normalizing on the basis of said low-frequency signal and the output of the said low-frequency
component; ~~is normalized on the basis of the said low-frequency signal,~~

and controlling the output-light of said light source ~~is controlled~~ in accordance with the said normalized low-frequency component.

2. (Currently Amended) The method for stabilizing operation point and optical output of an external optical modulator, as claimed in claim 1, wherein;

~~the~~ a means of controlling optical output of light source is equipped, which, in control of the output-light of ~~the~~ said light source,

detects the output-light from ~~the~~ said light source,

compares ~~the value of said detection~~ a value of the detected output-light from said light source to ~~the~~ a standard value of primary optical output determining primary optical output, and

adjusts the output-light of ~~the~~ said light source;

~~and the~~ said standard value of primary optical output is modified according to ~~the~~ a ratio of ~~the~~ a primary value of the said normalized low-frequency component to ~~the~~ a subsequent value;

and ~~the~~ said means of controlling optical output of light source is operated on the basis of ~~the~~ said modified standard value.

3. (Currently Amended) The method for stabilizing operation point and optical output of an external optical modulator, as claimed in claim 1, wherein;

in control of the output-light of ~~the~~ said light source, the output-light of said light source is controlled in order that ~~the~~ a primary value of ~~the~~ said normalized low-frequency component may accord with ~~the~~ a subsequent value.

4. (Currently Amended) ~~The~~ A device for stabilizing operation point and optical output of an external optical modulator, ~~which utilizes the method for stabilizing operation point and optical output of external optical modulator, as claimed in claim 1 to 3 comprising:~~

a light source,

an external optical modulator modulating light from the light source,

an optical detector detecting output-light from said external optical modulator,

means for regulating direct current bias applied to said external optical modulator, which regulates the direct current bias determining the operation point of a modulation curve of said external optical modulator, according to output of said optical detector.

means for superimposing onto said direct current bias a low-frequency signal, which is frequency below a lower limit of a signal frequency band of an input signal inputted to said external optical modulator.

means for extracting a low-frequency component included in the output of said optical detector,

means for normalizing on the basis of said low-frequency signal the output of said low-frequency component,

and means for controlling the output-light of said light source in accordance with said normalized low-frequency component.

5. (Currently Amended) The device for stabilizing operation point and optical output of an external optical modulator, as claimed in claim 4, wherein;
the said optical detector is a photodiode that is incorporated into the a module ~~including~~ comprising the external optical modulator.

6. (Currently Amended) The device for stabilizing operation point and optical output of an external optical modulator, as claimed in ~~claim 4 and 5~~ claim 4, wherein;
the said means of regulating direct current bias has an averaging circuit for obtaining the a mean value of output of ~~the~~ said external optical detector, and regulates the direct current bias applied to the external optical modulator in accordance with the a value of ~~the~~ said averaging circuit.

7. (Currently Amended) The device for stabilizing operation point and optical output of an external optical modulator, as claimed in ~~claim 4 to 6~~ claim 4, wherein; :

a low-pass filter or band-pass filter is used in order to extract the low-frequency component included in the output of the said optical detector.

8. (Currently Amended) The device for stabilizing operation point and optical output of an external optical modulator, as claimed in ~~claim 4 to 7~~ claim 4, wherein;

the said means of regulating direct current bias has slope-selecting means which, in fixing the operation point of the modulation curve of ~~the~~ said external optical modulator, enables ~~the~~ selection of slope of ~~the~~ said modulation curve.

9. (Currently Amended) The device for stabilizing operation point and optical output of an external optical modulator, as claimed in ~~claim 4 to 8~~ claim 4, wherein; ~~the~~ said light source is a laser diode.

10. (New) The device for stabilizing operation point and optical output of an external optical modulator according to claim 4, further comprising

a means of controlling optical output of the light source, which, in control of the output-light of said light source, detects the output-light from said light source, compares a value of the detected output-light from said light source to a standard value of primary optical output determining primary optical output, and adjusts the output-light of said light source;

wherein said standard value of primary optical output is modified according to a ratio of a primary value of said normalized low-frequency component to a subsequent value; and

said means of controlling optical output of light source is operated on the basis of said modified standard value.

11. (New) The device for stabilizing operation point and optical output of an external optical modulator according to claim 4, wherein, in control of the output-light of said light source, the output-light of light source is controlled in order that a primary value of said normalized low-frequency component may accord with a subsequent value.

12. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 5, wherein:

a low-pass filter or band-pass filter is used in order to extract the low-frequency component included in output of said optical detector.

13. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 6, wherein:

a low-pass filter or band-pass filter is used in order to extract the low-frequency component included in output of said optical detector.

14. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 5, wherein:

said means of regulating direct current bias has slope-selecting means which, in fixing the operation point of the modulation curve of said external optical modulator, enables selection of slope of said modulation curve.

15. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 6, wherein

said means of regulating direct current bias has slope-selecting means which, in fixing the operation point of the modulation curve of said external optical modulator, enables selection of slope of said modulation curve.

16. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 7, wherein:

said means of regulating direct current bias has slope-selecting means which, in fixing the operation point of the modulation curve of said external optical modulator, enables selection of slope of said modulation curve.

17. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 5, wherein said light source is a laser diode.

18. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 6, wherein said light source is a laser diode.

19. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 7, wherein said light source is a laser diode.

20. (New) The device for stabilizing operation point and optical output of an external optical modulator as claimed in claim 8, wherein said light source is a laser diode.